Artificial intelligence in the creative industries: a review

Abstract

This paper reviews the current state of the art in artificial intelligence (AI) technologies and applications in the context of the creative industries. A brief background of AI, and specifically machine learning (ML) algorithms, is provided including convolutional neural networks (CNNs), generative adversarial networks (GANs), recurrent neural networks (RNNs) and deep Reinforcement Learning (DRL). We categorize creative applications into five groups, related to how AI technologies are used: (i) content creation, (ii) information analysis, (iii) content enhancement and post production workflows, (iv) information extraction and enhancement, and (v) data compression. We critically examine the successes and limitations of this rapidly advancing technology in each of these areas. We further differentiate between the use of AI as a creative tool and its potential as a creator in its own right. We foresee that, in the near future, ML-based AI will be adopted widely as a tool or collaborative assistant for creativity. In contrast, we observe that the successes of ML in domains with fewer constraints, where AI is the 'creator', remain modest. The potential of AI (or its developers) to win awards for its original creations in competition with human creatives is also limited, based on contemporary technologies. We therefore conclude that, in the context of creative industries, maximum benefit from AI will be derived where its focus is human-centric—where it is designed to augment, rather than replace, human creativity.